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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/505,478	08/24/2004	Akihiko Tanigaki	2004-1242A	4000

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EXAMINER

HOGAN, JAMES SEAN

ART UNIT PAPER NUMBER

3752

DATE MAILED: 06/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/505,478	Applicant(s) TANIGAKI ET AL.	
	Examiner James S. Hogan	Art Unit 3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-12 and 14-16 is/are rejected.
- 7) ☒ Claim(s) 6 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>08/24/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 2 recite the limitation "the inner diameter D1 and the minor diameter D2". There is insufficient antecedent basis for this limitation in the claim without mention of the shape of the orifice or the upper chamber being of a round diameter.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 7-12, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,365,758 to Schaming.

Regarding claims 1-4, 12, 14 Schaming teaches a descaling nozzle comprising a elliptical discharge orifice (33) opening at a concave surface or concave area (36) of a front end, a tapered segment (at 33, figure 2) extending towards the upstream side from the discharge orifice, and a large-diameter segment (30) continuing with the tapered segment. Schaming does not teach the taper angle being between 30° to 80°, nor is a definitive diameter of the large segment in regards to the minor diameter of the nozzle

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orifice mentioned, however, in light of the compared Figure 2 versus Figure 2 of the instant application, it would appear to be well within the scope of one having ordinary skill in the art at the time the invention was made understood the tapered segment to have an angle of 30° to 80° , or even 40° to 60° , and to have compared the minor diameter of the elliptical discharge orifice and the major diameter of the larger segment above the tapered area and derived a number not less than 3, but less than 7, or less than 6, in order to optimize spraying in a descaling nozzle. Similarly, as per claim 5, the nozzle of Schaming can operate at 2000psi (13.79 Mpa) (Col 3, line 18), and is seen to be capable of performing at a flow rate of 40 to 200 liters/minute. As per claim 7 and 14, the flow path of the nozzle comprises a elliptical discharge orifice (33) opening at a concave surface or concave area (36) of a front end, a tapered segment (at 33, figure 2) extending towards with a possible taper angle of 40° to 60° and the cylindrical flow path extending from the upstream of the tapered flow path with the inner diameter of the upper segment being substantially the same. As per claim 8, the elliptical discharge orifice is fully capable for being of a size where the ratio of the major diameter relative to the minor diameter is 1.2 to 2.5 and, as stated previously, and where the ratio $D1/D2$ of the inner diameter $D1$ to the minor diameter $D2$ of the discharge orifice is 4 to 6. As per claim 9 and 15, where the nozzle of Shaming has a nozzle tip (32) fitted to a front end, and where the nozzle tip has an elliptical discharge orifice (33) opening at a concave surface or concave area (36) of a front end, a tapered segment (at 33, figure 2) creating a conical flow path spreading at a predetermined taper angle towards the upstream side of the discharge orifice, and the concave surface (36) comprises an inclined sidewall

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which inclines inwardly (See Figure 2, at 35) in the radial direction towards the upstream side from the front end. Summarily, Schaming discloses the claimed invention except for definitive nozzle orifice diameters, large segment diameters and conical taper angles. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have held the dimensions of the components making up a descaling nozzle to conform to the desired ratios, since it has been held that discovering an optimum value, that is, the preferred ratios and angles, of a result effective variable involves only routine skill in the art. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)

As per claim 10, 11 and 16, Schaming is silent on the material the nozzle tip is made of, however represents one having an elliptical discharge orifice (33) opening at a concave surface or concave area (36) of a front end, a tapered segment (at 33, figure 2) creating a conical flow path spreading at a predetermined taper angle towards the upstream side of the discharge orifice, and the concave surface (36) comprising an inclined sidewall which inclines inwardly (See Figure 2, at 35) in the radial direction towards the upstream side from the front end, as well as stated above, a possible ratio $D1/D2$ of the inner diameter $D1$ to the minor diameter $D2$ of the discharge orifice is not less than three. Schaming discloses the claimed invention with the exception of the nozzle tip being made of cemented carbide. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the tip out of cemented carbide, since it has been held to be within the general skill of a worker in the

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art to select a known material on the basis of its suitability for the intended use as a matter of obvious choice. See *In re Leshin*, 125 USPQ 416.

Allowable Subject Matter

Claims 6 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure is as follows.

U.S. Patent No. 5,931,392 to Adams, disclosing a nozzle

U.S. Patent No. 6,402,062 to Bendig et al, disclosing a nozzle

U.S. Patent No. 2,341,859 to Edwards, disclosing a nozzle

U.S. Patent No. 3,510,065 to Gigantino et al, disclosing a nozzle

U.S. Patent No. 5,158,235 to Johnson disclosing a nozzle

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Hogan whose telephone number is (571) 272-4902. The examiner can normally be reached on Mon-Fri, 7:00a-4:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Scherbel can be reached on (571) 272-4919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JSH
06/06/2006

A handwritten signature in black ink, appearing to read 'D. Scherbel', with a large, stylized initial 'D'.

David A. Scherbel
Supervisory Patent Examiner
Group 3700